

CLAIMS

What is claimed is:

1. A Hall effect sensor assembly comprising:

a Hall effect sensor;

an overmolded housing which is overmolded onto the Hall effect sensor; and

a magnet movably connected to the Hall effect sensor by a movable connection with the overmolded housing, wherein the movable connection restrains movement of the magnet to a path along and aligned with a Hall effect central sensing axis, and wherein the magnet is substantially prevented from tilting relative to the sensing axis.

2. A Hall effect sensor assembly as in claim 1 wherein the overmolded housing comprises a general tube section located above the Hall effect sensor.

3. A Hall effect sensor assembly as in claim 2 wherein the general tube section of the overmolded housing comprises two opposing curved columns defining a magnet movement path therebetween, and wherein the opposing columns each comprise an alignment slot therein.

4. A Hall effect sensor assembly as in claim 2 further comprising a second housing member, wherein the magnet is fixedly connected to the second housing member, and wherein the second housing member is movably located in the general tube section of the overmolded housing.

5. A Hall effect sensor assembly as in claim 4 wherein the second housing member comprises a tube shaped

section, wherein the tube shaped section is slidably mounted in the general tube section of the overmolded housing, and wherein interference between the tube shaped section and the general tube section provides a telescoping movement substantially preventing the second housing member from tilting relative to the overmolded housing.

6. A Hall effect sensor assembly as in claim 4 wherein the second housing member is snap lock connected to the overmolded housing.

7. A Hall effect sensor assembly as in claim 6 wherein the general tube section comprises guide slots, and wherein snap lock sections of the second housing member are movably located in the guide slots.

8. A Hall effect sensor assembly as in claim 1 wherein the overmolded housing comprises an open section, and wherein electrical leads of the Hall effect sensor span across the open section.

9. A Hall effect sensor assembly as in claim 1 wherein the overmolded housing comprises a base section adapted to be snap lock connected to a mounting frame.

10. A Hall effect sensor assembly as in claim 1 wherein the Hall effect sensor comprises leads with distal ends having the overmolded housing thereon to fixedly connect the distal ends to the overmolded housing, wherein exposed middle sections of the leads do not have the overmolded housing thereon, wherein the exposed middle sections are adapted to be connected to connection terminals, and wherein the overmolded housing retains the

exposed middle sections in a fixed orientation relative to each other and relative to the overmolded housing.

11. A vehicle seat sensor device comprising:

a frame;

a flexible printed circuit mat connected to the frame; and

a Hall effect sensor assembly as in claim 1 electrically connected to the flexible printed circuit and mechanically connected to the frame.

12. A vehicle seat sensor device as in claim 11 wherein the Hall effect sensor assembly is snap lock connected to the frame.

13. A vehicle seat sensor device as in claim 11 further comprising a plurality of terminals connecting electrical leads of the Hall effect sensor to electrical conductors in the flexible printed circuit mat, wherein the terminals each comprise a first connection section extending from a first side of the terminal piercing through the flexible printed circuit mat and making electrical connection with one of the electrical conductors and a second connection section extending from an opposite second side of the terminal wrapped around a portion of one of the electrical leads.

14. A vehicle air bag system comprising:

an air bag;

a controller connected to the air bag for activating the air bag; and

a vehicle seat sensor device as in claim 11, wherein the conductors of the flexible printed circuit are coupled to the controller.

15. A Hall effect sensor assembly comprising:

a housing comprising a first housing member and a second housing member, wherein the second housing member is slideably connected to the first housing member along an axis;

a Hall effect sensor connected to the first member, wherein the first housing member comprises an overmolded housing member which is overmolded on the Hall effect sensor;

a permanent magnet connected to the second housing member; and

a spring connected between the first and second housing members to bias the permanent magnet and second housing member in a direction away from the Hall effect sensor,

wherein the Hall effect sensor comprises electrical leads with distal ends having the overmolded housing member thereon to fixedly connect the distal ends to the overmolded housing member, wherein exposed middle sections of the leads do not have the overmolded housing member thereon, wherein the exposed middle sections are adapted to be connected to connection terminals, and wherein the overmolded housing member retains the exposed middle sections in a fixed orientation relative to each other and relative to the overmolded housing member.

16. A Hall effect sensor assembly as in claim 15 wherein the second housing member is slidably connected to the first housing member by a movable connection, wherein the movable connection restrains movement of the second housing member and the permanent magnet to a path along and aligned with a Hall effect central sensing axis, and wherein the permanent magnet is substantially prevented from tilting relative to the Hall effect central sensing axis.

17. A Hall effect sensor assembly as in claim 15 wherein the overmolded housing member comprises a general tube section located above the Hall effect sensor.

18. A Hall effect sensor assembly as in claim 17 wherein the general tube section of the overmolded housing member comprises two opposing curved columns defining a magnet movement path therebetween, and wherein the opposing columns each comprise an alignment slot therein.

19. A Hall effect sensor assembly as in claim 17 wherein the second housing member is movably located in the general tube section of the overmolded housing.

20. A Hall effect sensor assembly as in claim 19 wherein the second housing member comprises a tube shaped section, wherein the tube shaped section is slidably mounted in the general tube section of the overmolded housing member, and wherein interference between the tube shaped section and the general tube section substantially prevent the second housing member from tilting relative to the overmolded housing.

21. A method of assembling a Hall effect sensor assembly comprising steps of:

overmolding a first housing member onto a Hall effect sensor; and

movably connecting a permanent magnet to the first housing member by a movable connection, wherein the movable connection comprises a spring biasing the permanent magnet away from the Hall effect sensor, wherein the movable connection limits movement of the permanent magnet to a fixed orientation relative to the Hall effect sensor along a Hall effect central sensing axis, and wherein the permanent magnet is substantially prevented from tilting relative to the Hall effect central sensing axis.

22. A method as in claim 21 wherein the step of overmolding the first housing member onto the Hall effect sensor comprises overmolding the first housing member onto distal ends of the electrical leads of the Hall effect sensor and not overmolding the first housing member onto middle sections of the electrical leads.

23. A method as in claim 21 wherein the step of movably connecting the permanent magnet to the first housing member comprises connecting the permanent magnet to a second housing member, and snap lock connecting the second housing member to the first housing member, wherein the second housing member is slidably connected to the first housing member.